$$= \frac{r}{\sqrt{\frac{1}{C_1^2\omega^2} + r^2\left(1 + \frac{C_2}{C_1}\right)^2}} \qquad (9)$$

This attains a maximum value when r and C_1 are both infinite the maximum value being 1 which is, of course, obvious, as the circuit then consists of the E.M.F e directly across the capacity C_2.

We therefore conclude that the coupling condenser C_1 should be large compared with the grid-filament capacity of the valve, and that the grid leak r should be large compared with $1/C_1\omega$. The grid leak, however, must not have so high a resistance that it allows the grid to accumulate a negative charge large enough to carry the operating point off the straight portion of the characteristic.

It will thus be seen that the frequency of the signals to be received does not affect the value which we should give to the coupling condenser ; but the higher the frequency the smaller can be the resistance of the grid leak.

Any parasitic capacity across the grid leak at high frequencies will produce the same effect as an increase of grid-filament capacity, and all that is necessary to minimise this effect is to make the coupling condenser large compared with the grid-filament capacity of the valve *plus* the roughly estimated capacity across the grid leak.

As both the latter capacities are, in practice, small, any reasonably large capacity (say 0·002 microfarad), will work efficiently as a coupling condenser

THE LAW GOVERNING WIRELESS TRANSMISSION

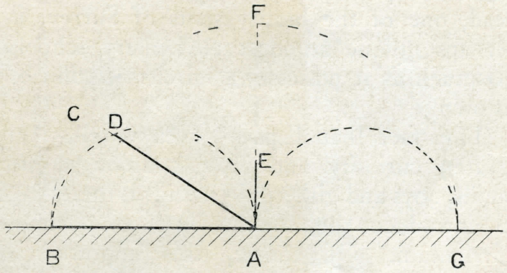
In the March 19th issue of *The Wireless World* a reply was given in the Questions and Answers columns to *J W* (*Leith*), who asked certain questions regarding a formula due to Professor Howe.

The following letter was received from J W. (Leith) in criticism of the replies published :—

" Many thanks for your answers to my queries published in the March 19th issue (p. 883), which I have only just received.

" Might I point out, however, that, with regard to question (1) my objection to Prof. Howe's formula, which gives field strength of a vertical aerial as inversely proportional to the distance from it (*Radio Review*, 1, p. 598, September, 1920), has not been cleared up ? If you remember, my contention was that the inverse square rule should apply

" You say that I had neglected the vertical wire's directional properties, but this is not so, as I have always understood that the radiation from such an aerial is proportional to the cosine of the angle between the direction of radiation and the horizontal.



" Thus, in the diagram, if AB represent the magnitude of the field-strength vector at any horizontal distance AB from the aerial AE, then at C, any point on the hemisphere of radius AB, the vector will